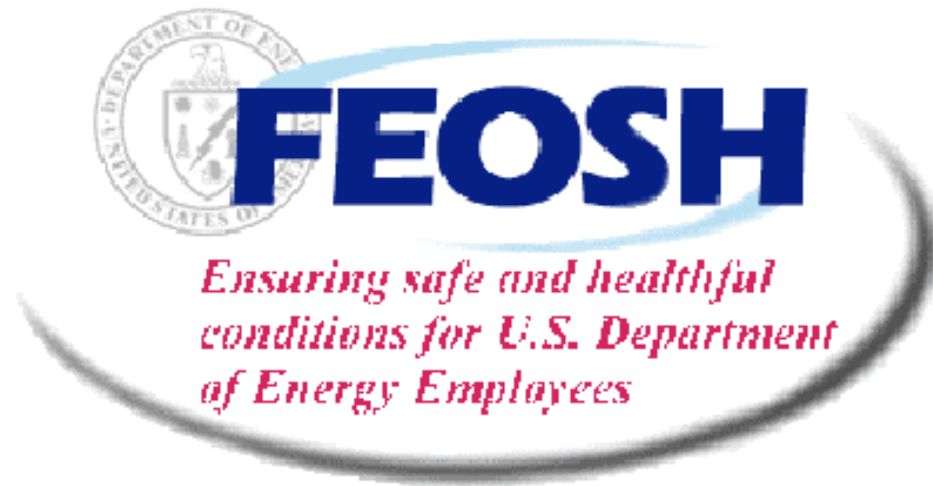


Hazard Communication Training for Department of Energy Office of Environment Safety and Health Federal Employees



Introduction to Hazard Communication

Training and Hazard Communication (HAZCOM)

Knowing how to work safely with chemicals that pose a hazard is an important activity. Assuring your safety is the reason for this training, bulletin boards in your workplace, safety meetings, MSDSs, and FEOSH bulletins. You have a right to know, but you also have a responsibility to use your knowledge and skills to work safely.

In addition to HAZCOM training you may be required to complete site specific additional training for beryllium, asbestos, radiation, or for other hazardous materials, if you travel to DOE facilities.



You Have a Right to Know

In 1983, the Federal Government established the OSHA Hazard Communication Standard. This standard is designed to protect employees who use hazardous materials on the job.

The Hazard Communication Standard requires that companies which produce and use hazardous materials must provide their employees with information and training on the proper handling and use of these materials.

Federal Employee Occupational Safety and Health (FEOSH) Program

The Department of Energy is required to, implement the Federal Employee Occupational Safety and Health (FEOSH) program, and comply with all OSHA regulations, under 29 CFR 1960.

Each agency head shall comply with all occupational safety and health standards issued under the Occupational Safety and Health Act of 1970 and Executive Order 12196, Occupational Safety and Health Programs for Federal Employees.

EH has designated a EH FEOSH Program Manager, and FEOSH Unit Coordinators for each Deputy Assistant Secretary. The names and contract information for these individuals may be found on the EH Portal, FEOSH Web page.

OSHA Hazard Communication Standard

The Occupational Safety & Health Administration requires under 29 CFR 1910.1200, that companies producing and using hazardous materials must provide employees with information and training on the proper handling and use of these materials.

You, as a DOE employee, have a Right to Know about the hazardous materials used in your work area and the potential effects of these materials upon your health and safety.

Key Elements of the OSHA Hazard Communication Standard

Materials Inventory - A list of the hazardous materials present in your work area.

Material Safety Data Sheets - A detailed description of each hazardous material listed in the Materials Inventory, must be provided by the manufacturer.

Labeling - Containers of hazardous materials must have labels which identify the material and warn of its potential hazard.

Training - All employees must be trained to identify and work safely with hazardous materials.

Written Program - A written program must be developed which ties all of the above together.

What Do I Need to Know?

You should ask yourself the following questions:

How can this material hurt me?

What can I do to protect myself?

Where can I find the answers to the first two questions?

Recognizing Hazards

The First Step

The first step in using chemicals safely is to recognize those materials that may be hazardous to your health or physical safety.

Hazardous materials (chemical products) are everywhere. Some of these chemical products pose little danger to you, while others are deadly.

You must know how to use chemicals safely.

Typical Hazards in DOE Office Environments

DOE office environments typically will not have highly toxic materials within them. However caution needs to be used to avoid un-necessary or excessive exposures to materials such as, cleaning solutions, photocopier, or printer powders, fixatives, toners and biohazards.

Follow the manufacturer's instructions found on the package labels for consumer products, and consult the MSDS on the EH Portal, FEOSH web page for additional information.

A general precaution for working with any consumer chemical is to protect your eyes and skin. Avoid breathing vapors and dusts.

If a spill occurs contact your supervision immediately and prevent others from entering the area.

How to Find Information

Where to Find the Information You Need

Your most immediate source for information can be found on labels attached to containers which hold various hazardous materials.

Your second source of information is Materials Safety Data Sheets (MSDSs). Material Safety Data Sheets will be discussed in the next section.

If you need further assistance contact, your supervisor, your Unit FEOSH Coordinator, or the EH FEOSH Program Manager. See the FEOSH web site for MSDSs and FEOSH Program contact information, at <http://tis.eh.doe.gov/feosh/>

What Must Be Labeled

The OSHA Hazard Communication Standard requires that ALL hazardous materials be labeled. Labels must appear either on the container itself, the batch ticket, placard, or the process sheets.

Hazardous chemicals in portable containers which are for the immediate use of the employee who performs the transfer is the exception to this rule.

Basic Label Information

OSHA requires that the following information be included on ALL labels:

The product name;

A warning statement, message or symbol; and

On commercial labels, manufacturers of hazardous materials must include their name and address.

Many manufacturers also include a statement describing safe handling procedures.

Material Safety Data Sheets

While labels are an effective way to display information about hazardous materials, there will be times when you will want more information than can be included on a label.

You can find additional information about the hazardous materials you work with in what is called a Material Safety Data Sheet, or MSDS for short.

You should take time to read and understand the MSDSs describing the hazardous materials present in your work area.

What is an MSDS?

A Material Safety Data Sheet (MSDS) provides detailed information about a specific hazardous material, such as;

Identity (name of substance)

Physical Hazards

Health Hazards (target organ)

Routes of Body Entry

Permissible Exposure Limits (PEL)

Carcinogenic Factors (cancer causing)

Safe-Handling Procedures

Data of Sheet Preparation

Control Measures (personal protective equipment)

Emergency First Aid Procedures (emergency telephone number)

Contact Information (for the preparer of the sheet)

Special Instructions

How to Find an MSDS

For DOE EH Employees MSDSs are located on the LAN through the EH Portal and FEOSH Web Site. MSDSs hard copies are available through your EH FEOSH Unit Coordinator or the EH FEOSH Manager.

Take time to read the MSDSs which describe the hazardous materials present in your work area.

Remember, knowing where MSDSs are located and how to use them is your responsibility, it is part of your job.

To view an example MSDS for copier toner that is typically found in DOE offices, click on this link:

<http://tis.eh.doe.gov/feosh/docs/XEROX5065BlackPowderMSDS.pdf>

Understanding Health Hazards

Major Types of Health Hazards

Any chemical that may be harmful to your health is called a health hazard. The following is a brief description of the major types of health hazards.

Corrosives - cause tissue damage and burns on contact with the skin and eyes.

Primary Irritants - cause intense redness or swelling of the skin or eyes on contact, but with no permanent tissue damage.

Sensitizers - cause an allergic skin or lung reaction.

Acutely Toxic Materials - cause an adverse effect, even at a very low dose.

Carcinogens - may cause cancer.

Teratogens - may cause birth defects.

Organ Specific Hazards - may cause damage to specific organ systems, such as the blood, liver, lungs, or reproductive system.

Toxicity vs. Exposure

There is a balance between toxicity and exposure. Exposure is the *AMOUNT* of something you are exposed to, or come in contact with, by inhaling, ingesting it, or by skin contact.

The less the toxicity, the greater the exposure you can tolerate without ill effects.

The greater the toxicity, the less exposure you can tolerate without becoming sick.



Safe Exposure Limits

OSHA sets mandatory Permissible Exposure Limits (PELs). The American Conference of Governmental Industrial Hygienists (ACGIH) recommends safe exposure limits (TLVs) for the chemicals used in your work area.

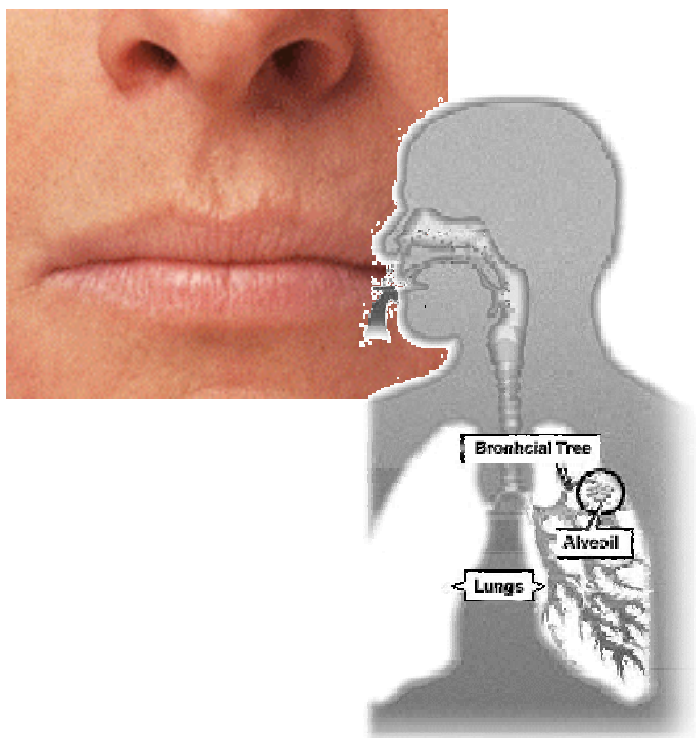
These limits are based upon a Time Weighted Average or TWA. TWAs have been established for all the chemicals you work with and limit the average amount of a chemical you can be exposed to over an eight hour day.



Routes of Exposure

It's important to remember that hazardous materials present a health hazard only when they come in contact with the body. Chemicals can enter the body in three ways:

Inhalation



Skin absorption



Ingestion



Inhalation

Inhalation is the most common route of exposure for most health hazards. This includes breathing in dust, fumes, mists, and vapors from solids, liquids, and gases.

Skin Contact

Some chemicals are absorbed into the body through skin contact. Corrosive chemicals can cause burns and tissue destruction by contacting the skin. Extra care must be taken to prevent skin and eye contact with these chemicals. Wearing aprons, gloves, eye protection, and other protective clothing is important.

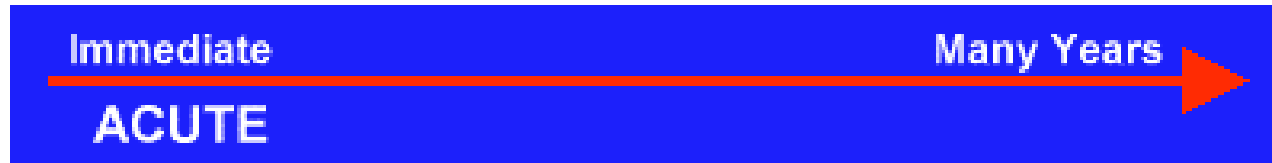
Ingestion

Never eat foods in areas where chemicals are used. Never smoke in areas where chemicals are used. Wash your hands and face with soap and water after working with chemicals before you eat, drink, or smoke.

Acute Health Hazards

Acute Health Hazards are those effects that occur immediately or soon after you come in contact with the hazardous material.

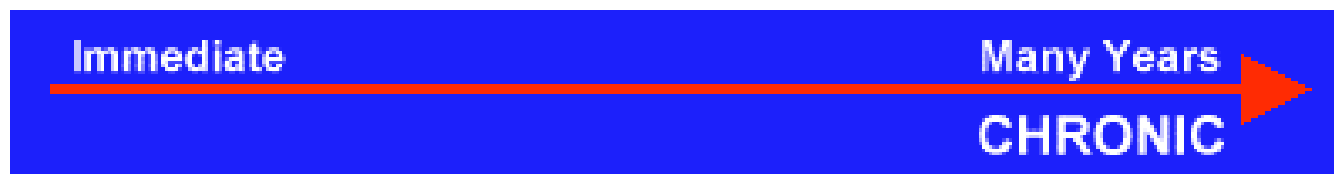
For example, you accidentally spill a strong acid on your hand. The acid will begin to burn your hand immediately. Or, you begin to work with a paint solvent in a closed area, and the fumes make you feel dizzy.



Chronic Health Hazards

Chronic Health Hazards are those whose effects take years or decades to occur after exposure(s).

An example of a chronic health hazard would be asbestos. The dangerous effects for people who have been overexposed to asbestos take years to appear and are directly linked to a number of lung diseases.



Your Basic Training is Completed!

This completes your Basic Hazard Communication Training for office employees.

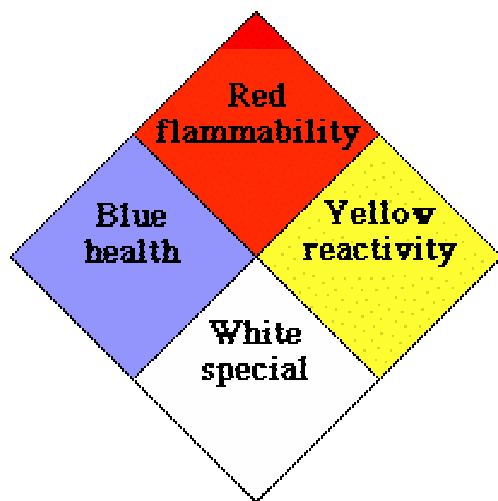
If you are a EH professional technical staff member and/or travel to the field, you may encounter more serious hazards, or if you want more in depth information. Please continue on with the slides to complete your General HAZCOM Training.



General Hazards and Labels that May Be Encountered at DOE Facilities

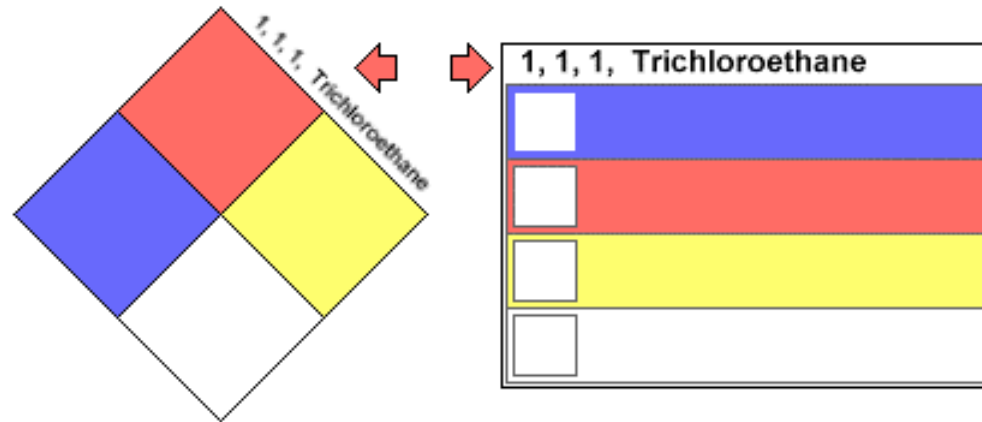
NFPA Labels

NFPA Rating - The National Fire Protection Association (NFPA) has developed a standard system (ANSI/NFPA 704) for indicating the health, flammability, reactivity, and special hazards of chemicals.



Chemical Name

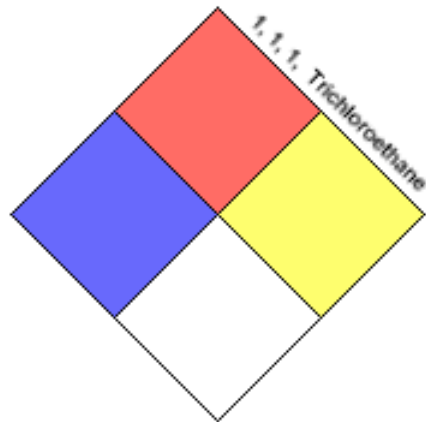
Toward the top of the label will be the chemical trade name of the hazardous material.



Hazard Class

Each colored bar or small diamond represents a different class of hazard. The hazard classes found on labels include Health, Flammability, Reactivity, and in some cases, Special Hazards.

Each hazard class uses a different color and a rating scale from 0 - 4.



1, 1, 1, Trichloroethane	
<input type="checkbox"/>	HEALTH
<input type="checkbox"/>	FLAMMABILITY
<input type="checkbox"/>	REACTIVITY
<input type="checkbox"/>	PROTECTIVE EQUIPMENT

Health Hazards

The first hazard class is Health Hazards. This hazard class is colored BLUE.

The rating scale for Health Hazards is listed below:

0 - No Hazard

1 - Slight Hazard

2 - Dangerous

3 - Extreme Danger

4 - Deadly



Flammability Hazards

The second hazard class is Flammability Hazards. This hazard class is colored RED.

The rating scale for flammability hazards is based on the flash point of the material. The flash point is the temperature at which the material gives off enough vapors to sustain ignition.

0 - Will Not Burn

1 - Ignites Above 200 Degrees Fahrenheit

2 - Ignites Below 200 Degrees Fahrenheit

3 - Ignites Below 100 Degrees Fahrenheit

4 - Ignites Below 73 Degrees Fahrenheit



Reactivity

The third hazard class is the Reactivity of the material. This hazard class is colored YELLOW.

The rating scale for Reactivity is listed below:

0 - Stable

1 - Normally Stable

2 - Unstable

3 - Explosive

4 - May Detonate



Special Hazards

Diamond shaped labels include a fourth hazard class called Special Hazards. This hazard class is colored WHITE.

These special hazards are represented by the following symbols:

 - Water Reactive

OX - Oxidizer

 - Radioactive

COR - Corrosive

ACD - Acid

ALK - Alkali

Physical Hazards

To help you identify materials which are physical hazards, the U.S. Department of Transportation (DOT) symbols are shown below.



What is a Physical Hazard?

Physical hazards are those substances which threaten your physical safety. The most common types of physical hazards are:

Fire

Explosion

Chemical Reactivity

Materials Which Use the Fire Symbol

There are three classes of materials which use the fire symbol.

1. Flammables can be gases, liquids or solids. Flammables ignite easily and burn rapidly. Liquid flammables have a flashpoint under 100 degrees Fahrenheit.
2. Combustibles are similar to flammables, but they do not ignite as easily. Liquid combustibles have a flash point above 100 degrees Fahrenheit.
3. Pyrophoric, or spontaneous combustion materials, burst into flames "on their own" at temperatures below 130 degrees Fahrenheit.



Working with Materials That Use the Fire Symbol

Whenever you work with a material that uses the fire symbol, be sure to read the warning label and the MSDS for safe handling procedures.

With flammables, combustibles, and pyrophorics, do not expose these materials to sparks, flames or other heat sources.

You must also not smoke or light a match or flame near them.



Materials That Use the Explosive Symbol

Explosives are materials which release a tremendous amount of energy in the form of heat, light and expanding pressure within a very short period of time.

Water Reactives react with water and may explode, or they may release a gas which is flammable.

Unstable Reactives are chemicals that can react or can become self-reactive when subjected to shock, pressure or temperature.



Working with Materials That Use the Explosive Symbol

Whenever you work with a material that uses the explosive symbol, be sure to read the warning label or the MSDS for safe handling procedures.

Because materials that use the explosive symbol are often very dangerous to work with, you may need additional training or instructions from your supervisor. Always check with your supervisor and follow your written procedures before handling or using materials that use the explosive symbol.



Materials That Use the Flaming "O" Symbol

Oxidizers cause other substances to burn more easily through a chemical reaction or change.

Organic Peroxides contain oxygen and act as powerful oxidizers.



Working with Materials That Use the Flaming "O" Symbol

Whenever you work with a material that uses the Flaming "O" symbol, be sure to read the warning label and the MSDS for safe handling procedures.



Materials That Use the Cylinder Symbol

Many gases such as nitrogen, oxygen, and acetylene are used in the manufacturing or construction work.

In order to transport, store and use these gases, they are "bottled" under great pressure in tanks called gas cylinders.

There is enough pressure in a cylinder that if it were to fall and break off the valve, it could be propelled through a wall or cause fatal injury.



Working with Materials That Use the Cylinder Symbol

Great care should be taken when you handle gas cylinders to insure that they are not damaged when they are moved and are secured from falling when used or stored.

In addition, you should read the warning label and the MSDS for safe handling procedures concerning the gas contained the gas cylinder.

Some gasses are toxic, or flammable, and may displace oxygen in the room.



Health Hazard Labels

To help you identify materials which are health hazards, the symbols shown below are often used.



Health Hazard Symbols

The Medical symbol is a general symbol used to identify materials which are health hazards.



Health Hazard Symbols

The Skull and Crossbones is a symbol that has been used for centuries. Today it is used to identify hazardous materials which are poisonous.

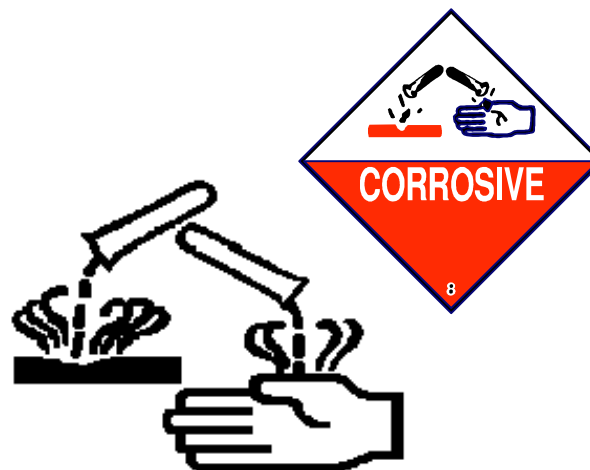
Poisons are substances such as, pesticides, cyanide, and arsenic.



Health Hazard Symbols

The symbol below is used to identify materials which are Corrosives. Corrosives cause tissue damage and burns on contact with skin or eyes.

Corrosive are substances such as, acids such as nitric and sulfuric, and alkalis like ammonia and sodium hydroxide.



Health Hazard Symbols

The symbols below are used to identify materials and sources which are Radioactive.

Radioactive sources include, plutonium, uranium, tritium, and americium and radiation generating equipment like x-ray, and gamma sources.



Health Hazard Symbols

The symbol below is used to identify hazardous Biological materials.

Bio-hazards are micro-organisms that include HIV, hepatitis, chickenpox, measles, tetanus, and many others.



Control of Hazards at DOE Facilities

Product Substitution

Because many chemicals do similar jobs, it is important to select chemicals that do a good job, while being less toxic.

An example of product substitution would be to replace the use of a pesticide using Malathion (on the right) with an soap pesticide (on the left) which is much less toxic.

Please do not bring chemicals in to work from home. If you have plants in your office, please use a soap based pesticide for your plants.



Engineering Controls

Well designed work areas minimize exposure to materials which are hazardous. Examples of engineering controls include; glove boxes, lab hoods, exhaust systems and wetting systems to control dust.



Safe Work Practices

Use of safe work practices will insure that chemicals are used correctly and safely.

Following procedures is an important part of your responsibility when using, handling, storing, or responding to a spill of a hazardous material.

A missed step could be disastrous. Do not leave your safety to memory, review your safe work procedures and MSDS before working with a hazardous material.

Personal Protective Equipment

Masks, eye protection, gloves, aprons, and other protective equipment and clothing are designed to protect you while you work. USE THEM!



Monitoring Exposure

Workplace and Personal Monitoring

Industrial hygiene or health physics personnel may sample the air and collect other samples determine if hazardous materials exceed established acceptable exposure limits.

Air samples are commonly taken using using a battery operated pump and filter or lapel badge, for an 8 hour shift.



Self Monitoring and Awareness

Monitor yourself and others. Be on the lookout for any physical symptoms which would indicate that you or your coworkers have been overexposed to any hazardous chemical.

Symptoms, such as skin rashes, headache, dizziness, eye or throat irritations, or lost work due to occupational related illness or injury, should be reported to your supervisor and occupational medicine department.

Your General Training is Completed!

This completes your General Hazard Communication Training, thank you for continuing to work safely. Your FEOSH program staff is ready to assist you.

Please occasionally consult the FEOSH web site for updated hazard information and MSDSs at <http://tis.eh.doe.gov/feosh/>

